Multi-Parameter – Handheld Photometer PPM 150

OPERATING INSTRUCTIONS

Gebrüder Heyl Vertriebsgesellschaft mbH, D-31135 Hildesheim, Phone +49 (0) 5121 7609-0,
Fax +49 (0) 5121 7609-44, E-Mail: vertrieb@heyl.de, www.heyl-vertrieb.de

Contents

Introduction 5

Technical Data 6
Scope of delivery 7
Things to know 9

Operating the photometer

Keyboard 11
Energy-saving function 12

Switch on 12
Method names 12
Performing measurements 13
Reaction times 15
Help text 15

Functions

Menu 16
History 16
Logger / Memory 17
Erase memory 18
Help 19

Setup

Favorites 20
Date and Language 22
Time 22
Off-Time 23
Sound 23
Light 24

Tips and possible sources of error

Cuvettes 25
Filling volumes 25
Cleanliness / Dryness 25
Blank 25
Rinsing the cuvettes 25
Scratched cuvettes 26
Light protection 26
Times 26
Dosage of liquid reagents 26
Dosage of solid reagents with spoons 26
Reagent tablets 26
Powder packs 26
Air bubbles 27

Messages in the photometer display

Battery 28
Below measuring range 28
Measuring range exceeded 28
Light protection 28
Improving accuracy 28

Information and safety instructions 29

Operating the Software

Introduction 30
Database 31

Measurements

New results 32
Display of results from History 32
Display of results from Memory 32
Open measurements 32
Save measurements 33
Export data 33
Print data 34
Locations 35
Data 36

Substances – definition of calibration curves

Name 37
Method 37
Maximal extinction 37
Maximal concentration 37
Diode 37
Symbol 37
Measuring range 38
Unit 38
Limit 38
Time 38
Custom 38
Calibration points 38

Help 39
Preferences 40
Profiles 40

Program

Connect 41
Program 41

Multi-parameter- hand photometer

Introduction

The microprocessor-controlled NEOMERIS PHOTOMETER PPM 150 offers complete solutions for the examination of your water and wastewater. This unit disposes of a substantial user guidance to simplify its handling to an utmost extent.

It operates with the latest LED (Light Emitting Diode) technology. Its measuring range reaches from 380 up to 810 nm with nine different diodes. An excellent reproducibility and a small slit width guarantee precise measuring results. Light emitting diodes emit a stable light and consume only little energy, so that this unit can also be used for a longer period of time. Its advanced optical design and its additional interference filter improving its precision have been developed especially for the NEOMERIS PHOTOMETER PPM 150. The unit is equipped with a large graphic LCD display with a resolution of 128 x 64 pixels.

Technical data

Spectral range:	380 – 810 nm
Extinction range:	-0.5 – 4.0 E
Electro optic precision:	+/- 1.5 % (in the range of 0.1 – 2.0 E at 20°C)
Photometric precision:	+/- 3 % (in the range of 0.1 – 2.0 E at 20°C)
Cuvette slot:	Round cuvettes with a diameter of 16 mm
Method memory:	Up to 150 methods
Internal memory:	1000 data records
Result memory:	The latest 50 results
Languages:	Up to 6 options for language guidance
Auto-Off time:	Elegible between 1 to 30 minutes
Internal power supply:	4 rechargeable accumulators (AA, Ni-MH, 2100 mAh)
External power supply:	9V DC (direct current) 300 mA
Performance (100 % charged):	Up to 1000 hours/ 20,000 measurements
Display:	LCD, 128 x 64 pixels, illuminated
Visible display surface:	62 x 40 mm
Interface:	Serial infrared interface
Dimensions:	255 x 93 x 54 mm (L x W x H)
Weight (with accumulators):	560 g
Temperature of the work environment:	+10°C up to + 40°C
Storage temperature:	- 10°C to + 50°C

Integrated clock and calendar

Scope of delivery

1	NEOMERIS Photometer PPM 150	
1	Cover for the cuvette slot	
1	Power adapter	
4	Accumulators (AA, Ni-MH, 2100 mAh), inside the unit	
1	IrDA adapter	
1	Operating Instructions for the NEOMERIS Photometer PPM 150 and Software on CD-ROM	
1	Cleaning brush	
10	Photometer cuvettes (for volumes of 10 ml)	
2	Reaction vessels (for volumes of 20 ml) A, B	
1	Funnel	
1	Cuvette stand	
2	Syringe 5 ml	
1	IrDA / USB cable	

OPTIONAL: Aluminium case with different levels

Gebrüder Heyl Vertriebsgesellschaft mbH, D-31135 Hildesheim, Phone +49 (0) 5121 7609-0,
Fax +49 (0) 5121 7609-44, E-Mail: vertrieb@heyl.de, www.heyl-vertrieb.de

Things to know

The NEOMERIS PHOTOMETER PPM 150 operates with a combined light emitting diode (LED) and filter technology. This guarantees the best possible precision of the nine available wavelengths of 380 nm, 430 nm, 470 nm, 500 nm, 520 nm, 560 nm, 610 nm, 700 nm and 810 nm.

The NEOMERIS PHOTOMETER PPM can measure extinctions ranging from -0.5 E up to 4.0 E. For your measurements we would recommend not to consider extinctions below 0.1 and above 2.0, as within these ranges the precision is not as high as within the range of 0.1 to 2.0.

The electro-optic precision for extinctions between 0.1 and 2.0 amounts to +/- 1.5 %. The test is performed with a grey filter.

The photometric precision for extinctions between 0.1 and 2.0 amounts to +/- 3.0 %. The test is performed with color filters.

The reproducibility of the measured extinctions is as follows:

–0.5 to –0.1 E:	+/– 0.005 E
–0.1 to –2.5 E:	+/– 0.002 E
>2.5 E:	+/– 0.005 E

The cuvette slot is suitable for commercially available 16 mm round cuvettes. During measurements the slot must be covered with a light protection cap. The photodiode and the light emitting diodes are sealed with glass and are watertight. Nevertheless, attention should be paid that water does not penetrate directly into the cuvette slot.
The upper and the lower parts of the housing are equipped with seals thus avoiding that water or dust can penetrate into the unit from there.

The software for the NEOMERIS PHOTOMETER PPM 150 can be operated with Windows 98 or a later version, but the computer must dispose of an infrared interface.
In the NEOMERIS PHOTOMETER PPM 150 up to 150 methods can be stored with the respective help texts in up to six languages. With the function “Favorites” each user can select the curves he personally uses most frequently. This selection can be changed at any time.

For documentation purposes the NEOMERIS PHOTOMETER PPM 150 disposes of two kinds of data memories. On the one hand there is a normal memory, to which you can transfer the measured values by pressing the MEM key. This memory can save 1000 measured values.
The results are saved in the memory indicating the respective curve, method, result, time, date and place (optional). Therewith the results are GLP-approved, i.e. by means of the software they can be transferred to an invariable file on the computer.
The second memory is the history function. In the history function the last fifty values measured with the photometer are saved. From the history memory results can also be filed in the memory at a later time. The history memory is continuously busy – if the 51st measurement is made, the oldest value is erased, the second oldest value moves up to rank no. 1 and the latest value becomes number 50.

On delivery the NEOMERIS PHOTOMETER PPM 150 is equipped with four rechargeable accumulators (AA Ni-MH, 2100 mAh), as-delivered condition: uncharged. Before the first usage the accumulators must be charged by means of the accompanying charger. When the power pack/charger is applied, the accumulators are charged and the unit operates with mains current. When the accumulators are charged, you can perform up to 20.000 measurements. The following functions consume a lot of energy: powered background light, links to the computer, and performance of measurements.

Even if the accumulators are completely empty, the stored data and the program of the NEOMERIS PHOTOMETER PPM 150 remain saved.

Operating the photometer

The NEOMERIS PHOTOMETER PPM 150 keyboard

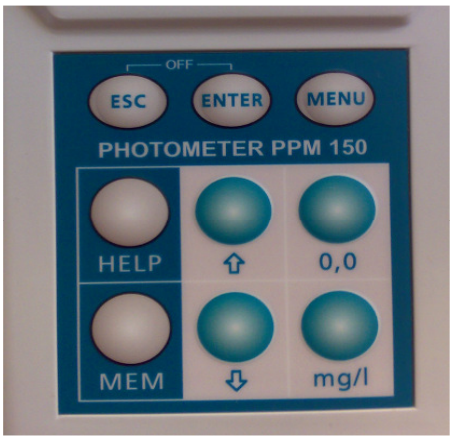
- **Switching on** – the NEOMERIS PHOTOMETER PPM 150 is switched on by pressing any of the keys.
- **Switching off** –the photometer is switched off by pressing ESC and ENTER together.

- ESC key – (Escape) similar to the computer you go one step back in the menu by pressing the ESC key.
- ENTER key – like on the computer it is used to confirm a selection, mainly used in the ***Setup*** Menu.

- MENU key – to call various menus, e.g. setup, memory and help.
- HELP key – to display brief operating instructions of each method.

- MEM key – to save the measured values.
- Arrow keys ⇧ and ⇩ - to move within the saved methods or help texts.

- 0.0 key – to measure the blank value
- mg/l key – analytical results

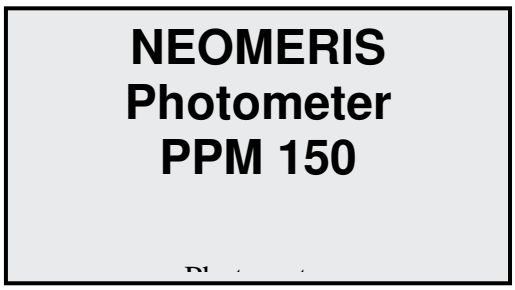


Energy-saving function

Some time after the last keystroke the photometer will switch off automatically. This is announced by acoustic signals (if the sound was not switched off). The period of time, after which the photometer will be switched off automatically, is at your option (to be selected in the setup menu under OFF-Time).

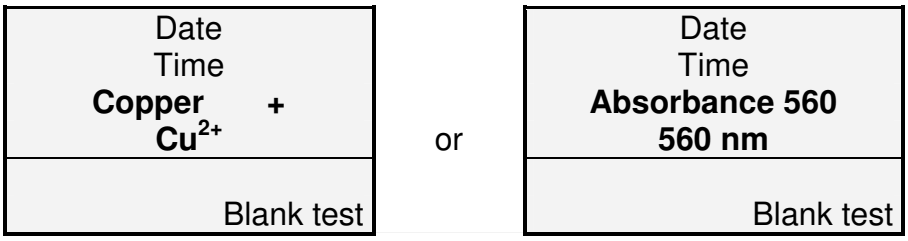
Switching the NEOMERIS PHOTOMETER PPM

The photometer is switched on by pressing any of the keys. When it is switched on, the display shows:



The serial number also appears on a label on the back of the unit.

Thereafter the unit immediately jumps to the last selected method. The following may appear on the display:



By means of the arrow keys ⇧ or ⇩ you can scroll through the alphabetically sorted menu of the saved methods.

Method names

Approx. 100 methods are saved in the NEOMERIS PHOTOMETER PPM 150, whereby some of the parameters exist several times. This is the reason why we used abbreviations to distinguish the methods pertaining to the various reagents.

Measuring ranges

Many products dispose of several measuring ranges, which are marked with **high**/ **hi**, **medium**, **low** / **lo** and **Uhi** = ultrahigh.

Test types

Some methods are destined for cuvette tests. These types are marked with a **K** before the extension indicating the reagent family (+, p or v).

Further additions

Some methods are marked with an asterisk * after the article numbers of the respective reagents. This asterisk means that additional articles are required to carry out this method. All further article numbers can be found in the operating instructions of the respective test.
Some parameters (e.g. chlorine) are marked with the extension **tot or t**. This means that the total chlorine will be determined and not the free chlorine.

The indications **10 ml** or **25 ml** refer to the sample volumes to be used for this test – they must strictly be observed, as the calibration curves were determined with these volumes and also the reagents were adapted accordingly.
The names of some parameters are too long to fit into the available fields and have been reasonably abbreviated. For example Ox scavenger for oxygen scavenger.

Performing measurements

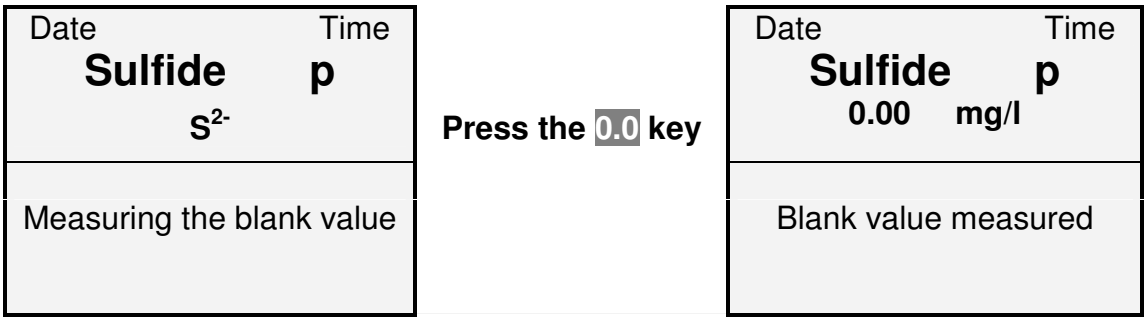
Use the arrow keys to select the method you would like to work with. Just to make sure that you have selected the correct method for the present reagents you can display the article number and the measuring range in the lower part of the display by pressing the HELP key once:

Date	Time
Sulfide S^{2-}	**p**
Sulfide	p 70098* AQ
Range:	0.008 – 1.0 mg/l

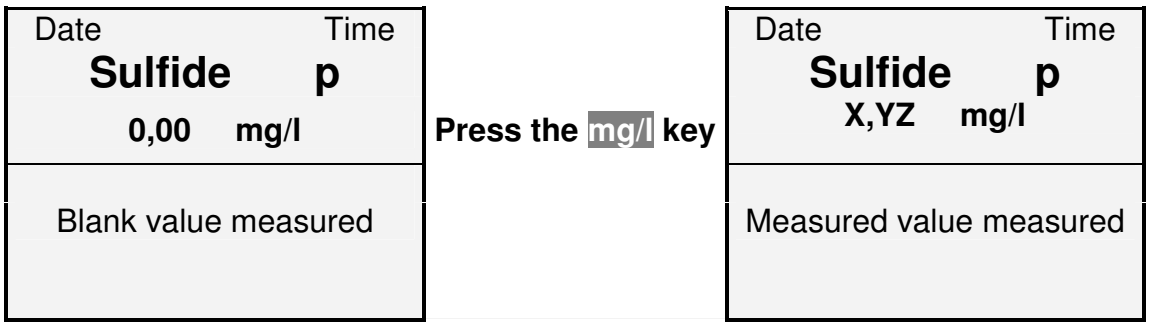
The exact denomination of the method to be used is also indicated in the operating instructions of the test.

The test is carried out according to the description in the operating instructions: First of all place the cuvette with the blank in the cuvette slot, close the cuvette slot with the covering cap and measure the blank value by pressing the 0.0 key. After receipt of the confirmation from the photometer the sample is placed in the cuvette slot, the cuvette slot is closed with the covering cap and the result is determined by pressing the mg/l key.
In the event that you should press a wrong key by mistake, the photometer will blow a beep signal.

Measuring the blank value:



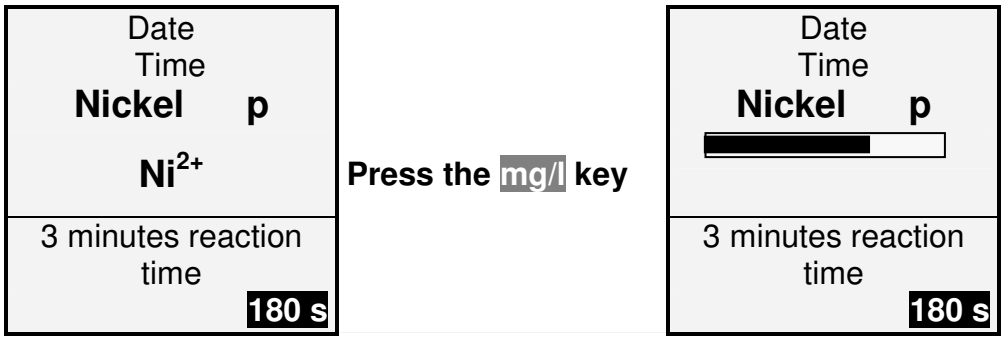
Determining the result:



After you have determined the result, you can directly save it by pressing the MEM key. The memory has capacity to store up to 1000 measured values with the associated information. You may carry out further measurements with the same method or select the next method with the arrow keys ⇧ or ⇩.

Reaction times

For some of the methods the reaction time is deposited in the database. This reaction time automatically starts when pressing the mg/l key. Please observe that tests with several reagents might possibly require a reaction time after addition of more than one reagent. The automatically started reaction time is always started after addition of the last reagent. If any reaction times should already be required before, of course, these times have to be considered as well. These reaction times can be found in the respective test descriptions of each method.
When a reaction time is started, it is displayed in seconds by a blinking LED in the lower-right corner (if the help text is switched on). Furthermore, the reaction time is plotted as a line on the display.



Counting down the reaction time is not always meaningful, e.g. for serial measurements. The reaction time can be bypassed by pressing the mg/l key twice or by pressing the ESC key. In this case the result will be measured immediately.

Each user has the option to save the reaction times (please see the software description) together with his curves.

Help text / brief operating instructions

The brief operating instructions can be displayed by means of the help function of the photometer. Select the method you would like to work with. When pressing the HELP key once, the method name and the article number appear. When pressing the HELP key twice, the help text appears.

First stroke HELP

Date	Time
Sulfide S^{2-}	**p**
Sulfide AQ	p 70098*
Range:	0.008 – 1.0 mg/l

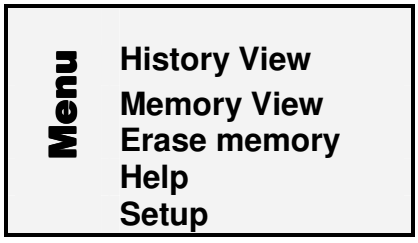
Second stroke HELP

Date	Time
Sulfide S^{2-}	**p**
10 ml sample	
Put it into a cuvette	

When you press the arrow keys ⇧ or ⇩ you can move forward and backward in the help text.
When you press the ESC key you leave the help menu.

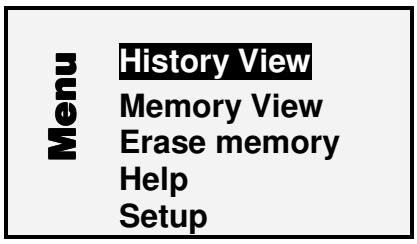
Functions

When you press the MENU key, the following is displayed:

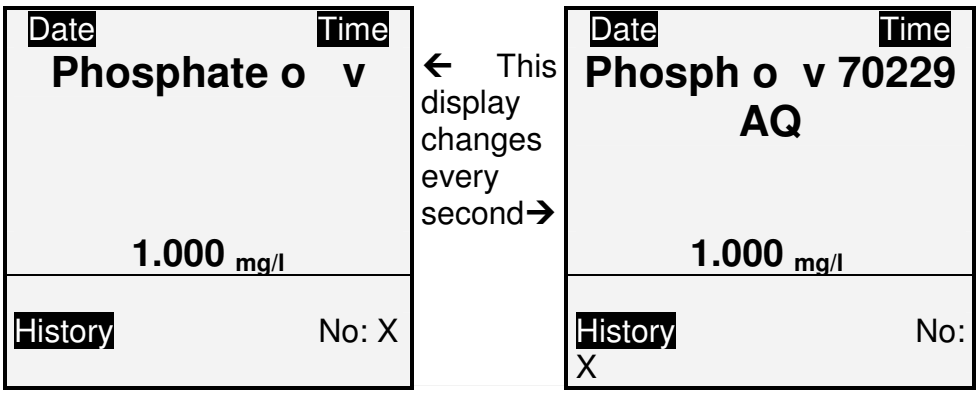


In this menu you will find five setup functions.

The *History* function

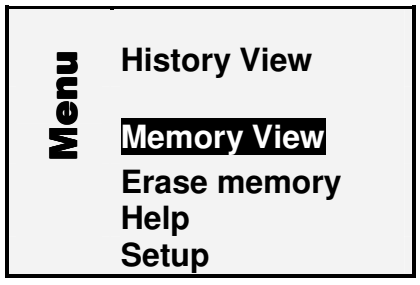


The function ***History*** can be selected by pressing the ENTER key. The last 50 measured values will be displayed. The display starts with the oldest value, which is marked as no. 1. With the arrow keys ⇧ or ⇩ you can scroll through the results.
In order to avoid any confusion with other modes, the History function is indicated by negative view of date and time on the display.

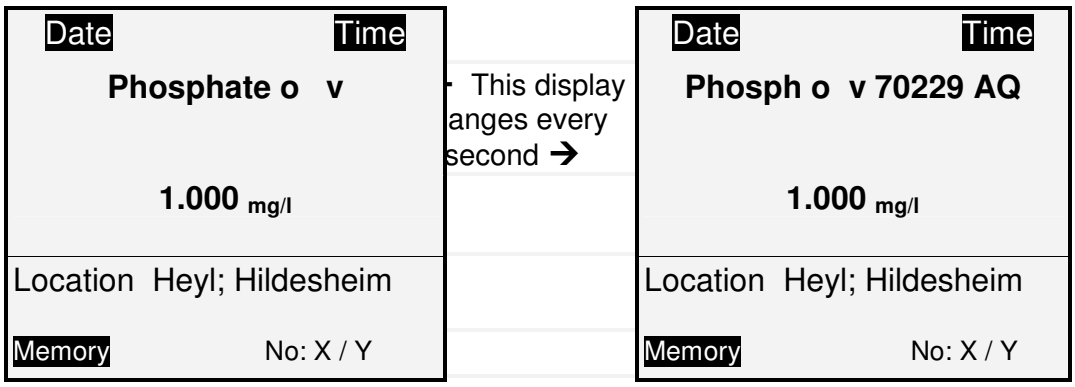


In this display you may still decide whether you would like to transfer a result to the memory at a later date. When the result appears on the display, press the MEM key. You will be asked for the storage location – this input is optional. You may either select a location you have previously defined by means of the software or leave the storage location blank by pressing the ENTER key. When you have entered the location / pressed the ENTER key, the unit will automatically jump to the normal method map.
On delivery no storage locations are saved in the database of the unit.

The *Memory* function

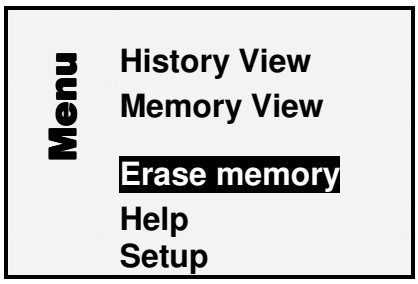


The function ***Memory*** can be selected by pressing the ENTER key. With the memory function up to 1000 saved results can be displayed (when pressing the MEM key). Just as the history function the memory function is also indicated on the display.



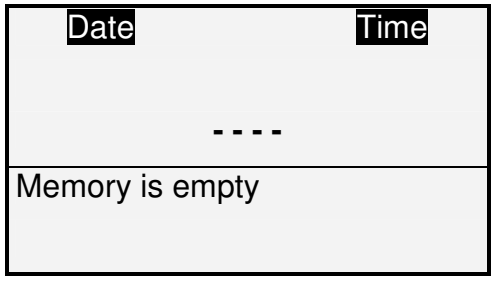
All saved values are numbered according to the following pattern: Number X of Y values (in the memory). The memory has capacity for up to 1000 measured values (together with all details shown in the graph above). You may transfer data from the memory to the computer at any time and then erase the memory.

The *Erase Memory* function



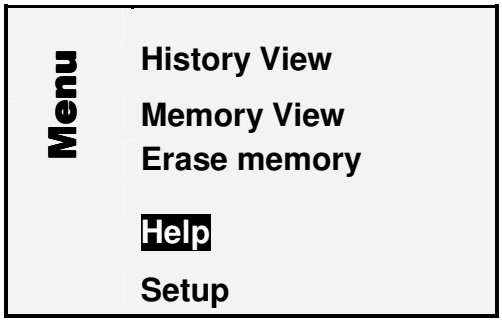
The function ***Erase memory*** can be selected by pressing the ENTER key. With this function all stored data will be erased. You should make sure that all data have previously been transferred to a file in the computer, as after deletion of the memory these data will no longer exist!
If your memory contains more than 500 results, you have the option to erase the first (oldest) 500 results. If you decide to erase only parts of your memory, results 1 to 500 will be erased and the results starting with 501 will be moved to the front and renumbered. The former result 501 becomes the new number 1, the result, which had the number 502 before deletion becomes number 2, and so on.

Data are erased by pressing the ENTER key. Thereafter the photometer asks for confirmation and if you are sure that you want to erase all data, press the ENTER key again. Then you will get the message that the memory is empty.



If you are not sure or want to save the stored data, you may leave this function by pressing the ESC key and all stored data will be preserved.

The *Help* function



The function ***Help*** can be selected by pressing the ENTER key. With this function you can display the complete help text for a parameter (on the whole display, not only in the two lower rows of the display like in the normal view). With the arrow keys ⇧ or ⇩ you can scroll through the text.

The help text refers to the last selected parameter. The method name appears in the upper line and the other six lines refer to the analysis. To leave the help function and return to the methods, press the ESC key.

The *Setup* function

The function ***Setup*** can be selected by pressing the ENTER key. In the Setup menu you have the option to set up various parameters like e.g. time, date, language and favorites. When you have selected the setup menu, the following display appears:

Setup MENU	PWR / BAT X%
Selected:	X / Y
Date:	DD-MM-YYYY
Time:	HH :MM :SS
OFF time:	X
Sound:	0 / 1 / 2
Light:	On / Off

With the arrow keys ⇧ or ⇩ the functions can be selected and when pressing the ENTER key the selected function is activated.

All information appearing in the upper line cannot be changed. The left display in the upper line informs you, where you presently are in the device software and the right display informs you about the electric charge of the photometer. It either appears PWR for mains operation / charging the accumulators or BAT X % indicating the state of charge of the accumulators. Below 35 % the figure of a battery appears between the date and the time and reminds you in all modes to charge the accumulators soon. If the accumulators are nearly empty the display further shows the message “Battery“.

The accumulators are only charged, if the power pack is connected and the photometer is switched off. When the photometer is switched on, it is operated by mains current.

Setup – Selected ➔ Favorites

Setup MENU	PWR / BAT X%
Selected :	X / Y
Date:	DD-MM-YYYY
Time:	HH:MM: SS
OFF Time:	X
Sound:	0 / 1 / 2
Light:	On / Off

This function shows the number of methods (X) selected from all available methods (Y). On delivery the display shows 95/95.
If you confirm with ENTER, you come to an alphabetic list of all (95) parameters. A cross marks each of these parameters. In order to establish a favourite list with your most frequently used parameters, select the parameters (with the arrow keys ⇧ or ⇩) you do not need and remove the crosses by pressing the 0.0 keys.

Setup MENU	PWR / BAT X %
[X] Absorbance 610	
[X] Absorbance 700	
[X] Absorbance 810	
[ ] Alka-m	p
[X] Alka-p	p
[ ] Aluminium	+

If you have deactivated all redundant methods this way, your selection must be confirmed by pressing the ENTER key. Afterwards the NEOMERIS PHOTOMETER PPM 150 automatically jumps back to the method display. When scrolling through the methods, you will observe that only those marked by a cross are displayed. In the setup menu under Selected you see e.g. 18 / 95. You can change your personal selection according to the above described procedure at any time. In order to display all available methods again, activate all deactivated curves by pressing the 0.0 keys.

Setup – Date ➔ **Language**

Setup MENU	PWR / BAT X %
Selected:	X / Y
Date:	DD-MM-YYYY
Time:	HH:MM: SS
OFF Time:	X
Sound:	0 / 1 / 2
Light:	On / Off

When selecting Date you can set up the date. The format is Day – Month – Year (01-12-2005). The digit to be changed will be highlighted. In the above figure the month would have to be changed now with the arrow keys ⇧ or ⇩. If you have reached the respective digit, confirm it by pressing the ENTER key. The display will move to the next digit.
After having confirmed the year the display will automatically jump to the language.

Setup MENU	PWR / BAT X %
Selected:	X / Y
Language:	German
Time:	HH: MM: SS
OFF Time:	X
Sound:	0 / 1 / 2
Light:	On / Off

With the arrow keys ⇧ or ⇩ you can scroll through the languages available in the NEOMERIS PHOTOMETER PPM 150. Confirm your desired language with ENTER. Thereafter the photometer will automatically jump back to the methods.

Setup – Time

Setup MENU	PWR / BAT X %
Selected:	X / Y
Date:	DD-MM-YYYY
Time:	HH: MM: SS
OFF Time:	X
Sound:	0 / 1 / 2
Light:	On / Off

When selecting Time you can set up the time. The format is Hour–Minute–Second (12:05:33). The digit to be changed is always highlighted. In the above figure the hour would now be changed with the arrow keys ⇧ or ⇩. If you have reached the right digit, confirm it by pressing the ENTER key. The display will move to the next digit of the time. After confirmation of the seconds the photometer will automatically jump back to the method display.

Setup – OFF Time

Setup MENU	PWR / BAT X %
Selected:	X / Y
Date:	DD-MM-YYYY
Time:	HH:MM: SS
OFF Time:	X
Sound:	0 / 1 / 2
Light:	On / Off

The OFF time defines the energy-saving function of the photometer, which is indicated in minutes. Here you have the option to determine, after which period of time after your last action (key press) on the NEOMERIS PHOTOMETER PPM 150 the photometer shall be switched off automatically.

This period of time can be selected within a range of 1 to 59 minutes. If you enter 0, the unit will not be switched off automatically.

With the ENTER key you can access the input field and with the arrow keys ⇧ or ⇩ you can change the minutes. After confirmation of the adjusted OFF time with ENTER the photometer will automatically jump back to the method display.

Setup – Sound

Setup MENU	PWR / BAT X %
Selected:	X / Y
Date:	DD-MM-YYYY
Time:	HH:MM: SS
OFF Time:	X
Sound:	0 / 1 / 2
Light:	On / Off

The NEOMERIS PHOTOMETER PPM 150 has the option to accompany various actions with sounds (for example: key strokes, the last seconds before the automatic switch off, measuring errors). The sound can be selected by means of the function Sound and the arrow keys ⇧ or ⇩. Option 0 is dumb, option 1 confirms that a function is carried out and option 2 confirms the functions as well as each keystroke with a beep. The selected sound has to be confirmed with ENTER. Thereafter the NEOMERIS PHOTOMETER PPM 150 will jump back to the methods.

Setup – Light

Setup MENU	**PWR / BAT X %**
Selected:	**X / Y**
Date:	**DD-MM-YYYY**
Time:	**HH:MM: SS**
OFF Time:	**X**
Sound:	**0 / 1 / 2**
Light:	**On / Off**

With this function you have the option to select whether the display of the NEOMERIS PHOTOMETER PPM 150 shall permanently be illuminated (On) or not (Off). If you select Off, the display will only be illuminated from behind for approx. 3 seconds when a results is displayed and thereafter will darken again. If you select On, the background light will permanently be illuminated. Please take into consideration that the light consumes much energy.

If you connect the power pack to charge the accumulators, the light will permanently be illuminated.

Some tips / possible sources of error

- **Photometer cuvettes**

The provided photometer cuvettes have a maximum volume of 10 ml. As the sample volumes of some tests are higher, these tests have to be carried out in the provided test glasses and a part of the reacted sample has to be poured into the photometer cuvette only for measuring purposes. If you need further cuvettes for your measurements, you can order a refill package (5 units) with the article number 37561.

- **Filling volume of the cuvettes**

In order to achieve an unimpeded transmission of radiation through the blank and the test sample a minimum volume of 4 ml has to be observed in the cuvette. As a precaution we would recommend to fill the cuvette with the blank at least up to the half. The exact volumes for test samples are always indicated in the test description.

- **Cleanliness / dryness**

Before each measurement the outside of the photometer cuvettes should be wiped clean and dry with a soft tissue (e.g. face tissue or soft tissue). Already a fingerprint can falsify the result. Fingerprints can be removed with a tissue wetted with alcohol.

- **Blank value**

Before each measurement with a newly adjusted parameter a blank calibration has to be performed – in this way e.g. an inherent color of the water sample can be compensated. After each change in method or if the unit is switched on again, a blank calibration is required. Except as otherwise described, an empty cuvette with at least 5 ml of the water sample to be analyzed is used to determine the blank value.
Strongly colored or turbid water samples have to be pretreated (e.g. by filtration).

- **Rinsing / cleaning the cuvettes**

All cuvettes, glass units and other auxiliaries used for an analysis have to be cleaned thoroughly after usage. Already slight residues of dyes or reagents may lead to falsified results during the next analysis.
Rinse the cuvettes with the water sample to be analyzed before each measurement. If possible, you should rinse the cuvettes with distilled water after each usage (DIY-superstore / gas station / drugstore).
Do not use any detergents, as the active ingredients may lead to wrongly positive results in some analyses. Discolorations of glass can be removed by rinsing it shortly with diluted sodium hydroxide solution using a brush for test glasses. Do not leave the sodium hydroxide solution in the cuvettes for a longer time, as sodium hydroxide solution may etch glass.

- **Scratched / contaminated cuvettes**

Strongly contaminated or scratched cuvettes must no longer be applied.

- **Light protection**

The light protection cap has to be put on the cuvette slot before every measurement, as otherwise it could be falsified by invading light.

- **Times**

In order to achieve an exact result the reaction times indicated in the instructions for use must strictly be observed.

- ***Dosage of liquid reagents***

Liquid reagents are reproducibly dosed, if the reagent bottle is held vertically over the opening of the test vessel to add the reagents drop wise.

- **Dosage of solid reagents with spoons**

One spoon means a level spoonful of reagent, i.e. that the solid matter on the spoon exactly reaches the rim of the spoon. A heaped spoonful may lead to a wrong result. The indicated number of possible tests was also calculated for level spoonfuls of reagents.

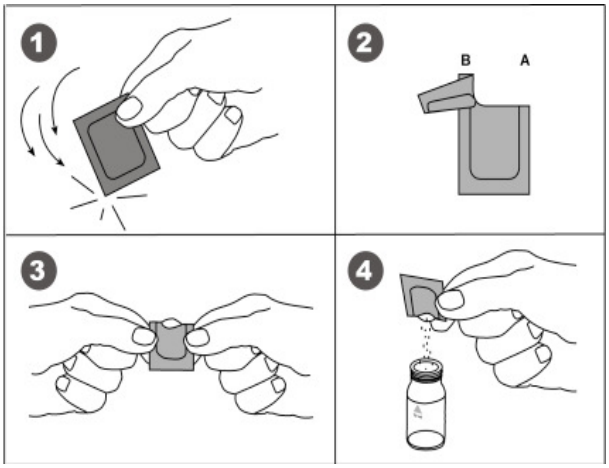
- **Reagent tablets**

The reagent tablets must be put into the test vessel directly from the foil without touching them by hand – on the one hand this is for safety reasons, as you are handling hazardous materials and on the other hand residues on your skin could falsify the results.
The tablets are added to the sample by ripping open one side of the foil. Do not press them out like common pain relievers. When you rip open one side of the foil, you avoid that the tablets crumble, thus assuring that the correct dosage of the reagent is added.

- **Powder packages**

The content of one powder package is exactly sufficient to analyze the respective parameter. It is important to use all the powder. Nothing should be left in the package.

1. Tap the pack on a hard surface to collect the powdered reagent in the bottom.



2. Tear (or cut using a pair of scissors) across from A to B holding the pack away from your face.

3. Using 2 hands, push both sides toward each other to form a spout.

4. Pour the pack content into the sample cell and continue the procedure according to the HACH instructions.

- **Air bubbles**

Air bubbles sticking to the inner walls of the cuvettes when filling them with water samples may lead to measuring errors. Air bubbles can be removed by careful swaying. If this is ineffective, the cuvette can carefully be pushed on a solid base. The bubbles will escape upward.

Messages in the photometer display

The NEOMERIS PHOTOMETER PPM 150 communicates with you by means of texts appearing in the display. It recognizes measuring errors and communicates them to you. All messages are accompanied by an acoustic signal.

Battery

If the energy of the accumulators is nearly exhausted, the message "Battery" will appear on the display Now the accumulators have to be charged. If this message is ignored for a longer period of time, the unit stop certain functions (background light, measurements).

below measuring range

For this measurement the stipulated minimum extinction was not reached. The result is below the lower limit of the measuring range.

Measuring range exceeded

For this measurement the stipulated maximum extinction was exceeded; the result clearly exceeds the indicated measuring range. In order to detect the effective sample concentration, dilute your sample, e.g. at the ratio of 1:10, repeat the test and then multiply the achieved result with the dilution factor, which in this example is 10.

Light protection

The light protection cap must be put on for every measurement. Invading light may falsify the results.

Improving accuracy

Every displayed result is the average value of several measurements. If any outliers occur during measurements, a new measurement will be started. In this case the display will show "**Improving accuracy**". This photometer-controlled new measurement can e.g. be observed, when extinction values above 1.5 were measured.

Information and safety instructions

⇨ Please observe that chemical tests, which also contain hazardous materials.

⇨ The hazard symbols and the R and S phrases on the labels of the reagents provide information about the hazardous materials and their respective risks. Dangerous components of the tests are named on the labels. The safety instructions on the labels must strictly be observed.

⇨ Gebr. Heyl Vertriebsgesellschaft mbH provides you with safety data sheets indicating the risks and safety instructions as well as the dangerous components of each test kits on request.

⇨ We recommend to wear **safety goggles** and to keep **safety gloves** ready when handling chemical tests.

⇨ Never fill chemicals into beverage bottles! Neither store nor transport water samples or collected waste in beverage bottles. Vessels containing sample or waste must always be marked or labelled accordingly.

⇨ Do not swallow any chemicals.

⇨ Store the reagent set in such a way that it does not come into contact with foodstuff.

⇨ Reagent bottles must always be closed and stored in such a way that they are inaccessible to children.

⇨ Do not eat, drink or smoke when working with the test kit.

⇨ If reagents come into touch with skin or eyes, immediately rinse with copious amounts of water.

⇨ Children and adolescents are only allowed to use the test kit, if an adult is present.

⇨ In general used test solutions are not hazardous to water and can be disposed in the domestic waste water system.

The reagents used in the NEOMERIS PHTOMETER PPM 150 test systems have been developed in terms of environmental compatibility. The test solutions used to perform the tests can be disposed in the local waste water system.

The reagents used in the NEOMERIS PHOTOMETER PPM 150 test systems distinguish themselves by a high analytical purity and sensitivity. The strict limits of the Drinking Water Ordinance are kept. In order to receive reproducible measuring results, the following instructions must be observed:

- Close every reagent bottle directly after usage in order to avoid that you mix up the caps.
- The temperature of the water sample should range between 15°C and 25°C.

SOFTWARE

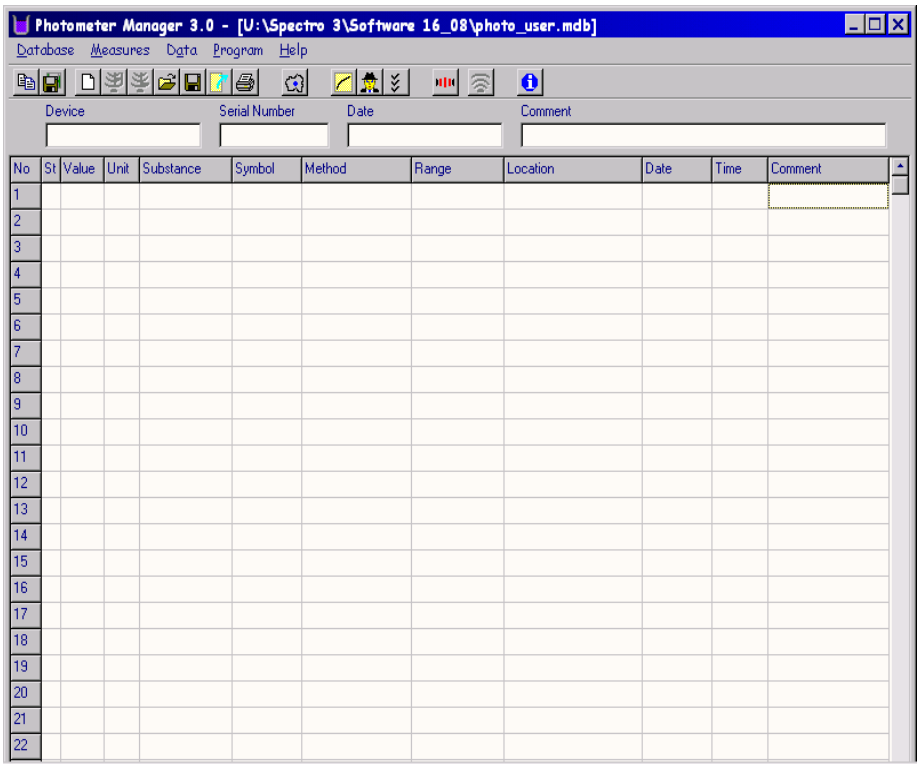
The NEOMERIS PHOTOMETER PPM 150 software is supplied together with the photometer. The used computer must support Windows 98 or higher. The user interface of the NEOMERIS PHOTOMETER PPM 150 was adapted to the Windows interfaces. The software language is English.
Enabling the communication between the NEOMERIS PHOTOMETER PPM 150 and a computer the NEOMERIS PHOTOMETER PPM 150 disposes of an infrared interface. You might have to install this interface on your computer first.

➔ Enabling the communication between the NEOMERIS PHOTOMETER PPM 150 and a computer you must switch the photometer to the setup mode!

First of all you have to install the software on your computer. There are two files on the CD-ROM. If you click on the setup symbol, an automatic installation program is started. All data are written into a directory called NEOMERIS Photometer PPM 150.

After installation you may either establish a link to the program on your desktop or start directly it from the directory.

If you double-click on this symbol, the installed software is opened. The following image appears on your screen:


Photometer Manager 3.0 - [U:\Spectro 3\Software 16_08\photo_user.mdb]
Database Measures Data Program Help
Device
Serial Number
Date
Comment
No St Value Unit Substance Symbol Method Range Location Date Time Comment
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

The icons are segmented in five functional groups:

Database	Measurements	Locations	Data	Program

1. Database

All data, which are important to operate the photometer, are saved in an access database (*.mdb).

With the functions OPEN and SAVE you can switch between different databases. With one of these functions you should establish a backup copy of your database, before you modify the software or the saved parameters.
The database you are currently working in is displayed in the lower part of the program window. All changes are automatically saved in the displayed database. In order to display changed in the photometer, you initially have to establish a connection between the interface of the photometer and the computer and transfer the new data. The interfaces on the computer and the NEOMERIS PHOTOMETER PPM 150 should have visual contact.
The last used database is saved in the system files of the computer and when the software is opened again, it automatically accesses this database.
The database Photom_data.mdb, which should be stored in the same register as the file LEDPhotom.exe, is only needed for installation and the first use.

2. Measurements

The main window of the software shows a report (in tabular form) of the measured values, which may either originate from the “History“ or the “Memory“. The results may also be opened in the file. This main group with the respective icons is destined to administer and process measured values.

2.1 New results

Deletes the content of the report / the table with the measured values from the screen. Before the data disappear, you will be asked, whether you would like to save any changes – you have the options to either save all selected data in a file, print them out or delete them all.

2.2 Display of results from the History function

(The symbol with the blue H) Display of results from the History function of the photometer. This function requires an active connection to the computer.
In the History function the last measured 50 values are automatically displayed. If you decide to save a value in the memory only after measurement, you can do so later using the History function. No values can be deleted from the History function.

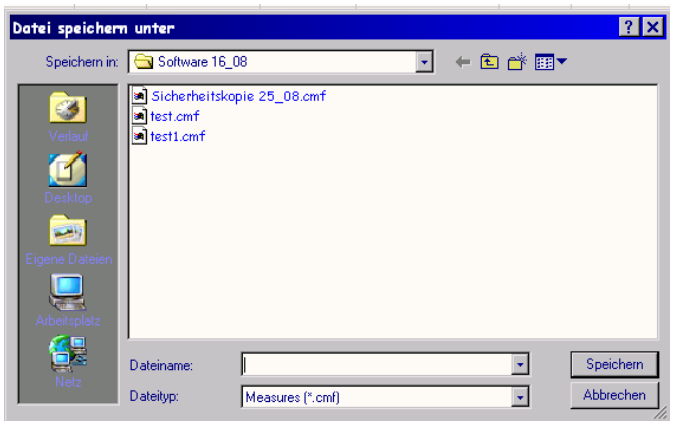
2.3 Display of results from the Memory

(The symbol with the blue L) With this function results from the memory of the photometer can be displayed. For this purpose an active connection between the photometer and the computer is required.
The memory has capacity for 1000 results. These results are saved together with the parameters, the applied calibration curve, the location (option), time and date. The saved values are numbered consecutively, whereby storage location 1 contains the oldest and storage location 999 the latest result.
If all storage locations are occupied, you are automatically requested to transfer or delete the data.
In order to distinguish the memory mode from the measurement mode on the display of the photometer the date and time indications in the memory mode are displayed in negative form (light text on dark background).

2.4 Opening measurements

With this function all saved measurements can be opened.

2.5 Saving

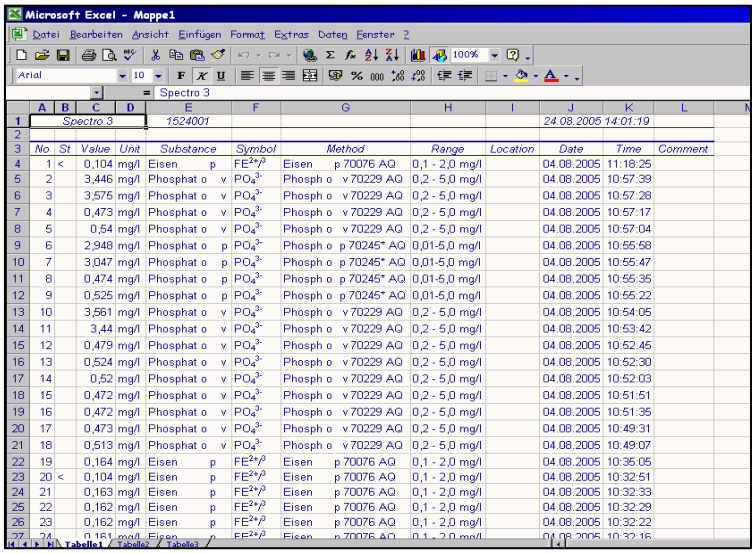


2.6 measurements

With this function the results and the respective data can be saved in a register file of the software. You can choose the file name option.

2.7 Exporting data

With this function data displayed in a report on the screen (e.g. History content) can be exported to an Excel file. When you click on this icon, all data will automatically be transferred to Excel.

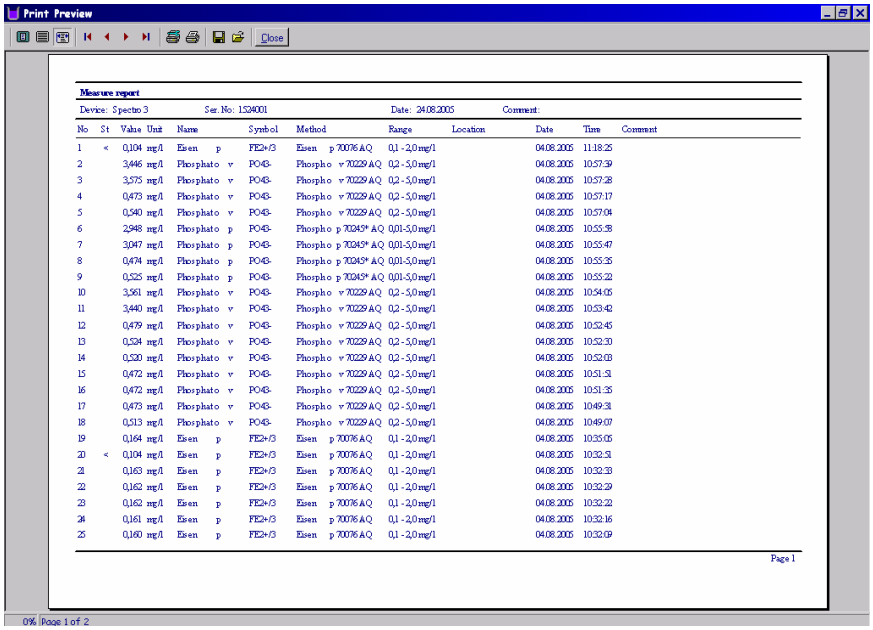


No	St	Value	Unit	Substance	Symbol	Method	Range	Location	Date	Time	Comment
1	<	0,104	mg/l	Eisen p	$FE^{2+/3}$	Eisen p 70076 AQ	0,1 - 2,0 mg/l		04.08.2005	11:18:25	
2		3,446	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:57:39	
3		3,575	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:57:28	
4		0,473	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:57:17	
5		0,54	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:57:04	
6		2,948	mg/l	Phosphat o p	PO_4^{3-}	Phosph o p 70245* AQ	0,01-5,0 mg/l		04.08.2005	10:55:58	
7		3,047	mg/l	Phosphat o p	PO_4^{3-}	Phosph o p 70245* AQ	0,01-5,0 mg/l		04.08.2005	10:55:47	
8		0,474	mg/l	Phosphat o p	PO_4^{3-}	Phosph o p 70245* AQ	0,01-5,0 mg/l		04.08.2005	10:55:35	
9		0,525	mg/l	Phosphat o p	PO_4^{3-}	Phosph o p 70245* AQ	0,01-5,0 mg/l		04.08.2005	10:55:22	
10		3,561	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:54:05	
11		3,44	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:53:42	
12		0,479	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:52:45	
13		0,524	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:52:30	
14		0,52	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:52:03	
15		0,472	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:51:51	
16		0,472	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:51:35	
17		0,473	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:49:31	
18		0,513	mg/l	Phosphat o v	PO_4^{3-}	Phosph o v 70229 AQ	0,2 - 5,0 mg/l		04.08.2005	10:49:07	
19		0,164	mg/l	Eisen p	$FE^{2+/3}$	Eisen p 70076 AQ	0,1 - 2,0 mg/l		04.08.2005	10:35:05	
20	<	0,104	mg/l	Eisen p	$FE^{2+/3}$	Eisen p 70076 AQ	0,1 - 2,0 mg/l		04.08.2005	10:32:51	
21		0,163	mg/l	Eisen p	$FE^{2+/3}$	Eisen p 70076 AQ	0,1 - 2,0 mg/l		04.08.2005	10:32:33	
22		0,162	mg/l	Eisen p	$FE^{2+/3}$	Eisen p 70076 AQ	0,1 - 2,0 mg/l		04.08.2005	10:32:29	
23		0,162	mg/l	Eisen p	$FE^{2+/3}$	Eisen p 70076 AQ	0,1 - 2,0 mg/l		04.08.2005	10:32:22	
24		0,161	mg/l	Eisen p	$FE^{2+/3}$	Eisen p 70076 AQ	0,1 - 2,0 mg/l		04.08.2005	10:32:16	

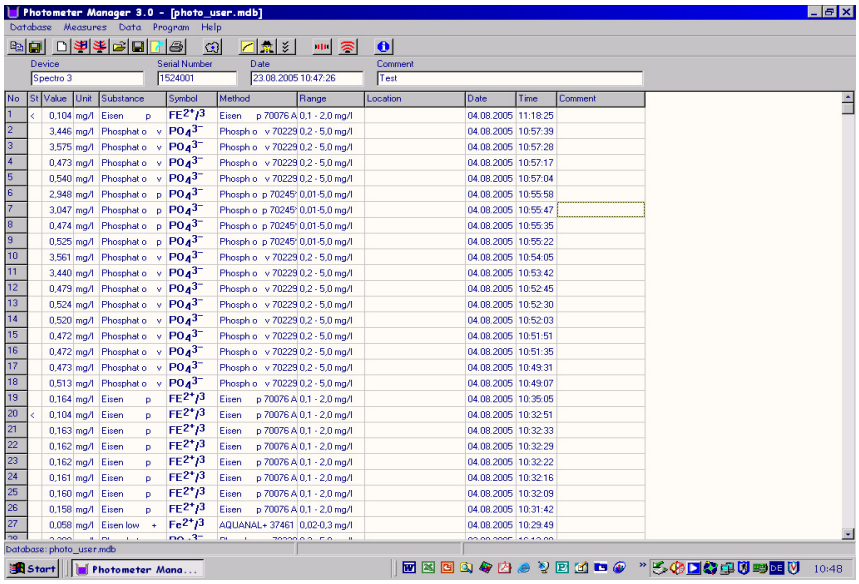
2.8 Printing data

Prints all data displayed on the screen. Data will automatically be transferred into the format shown below (Printing data 1):

Reports displayed in the main window show the results with all pertaining data (like e.g. time and date). None of these fields can be modified. The user has the option to enter an additional comment in the field “Comment“. All data listed in this report (Printing data 2) are automatically linked with the name of the unit, the serial number and the date of data transfer. Also these data cannot be modified.
Therefore all files with the extension .cmf are unchangeable original files and can be used e.g. for documentation purposes.



Printing data 1



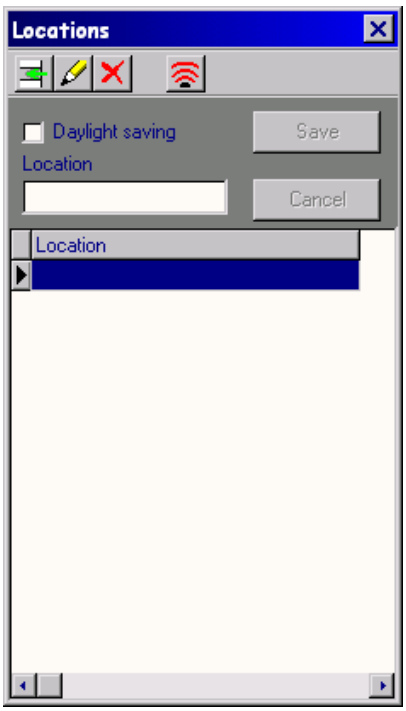
Printing data 2

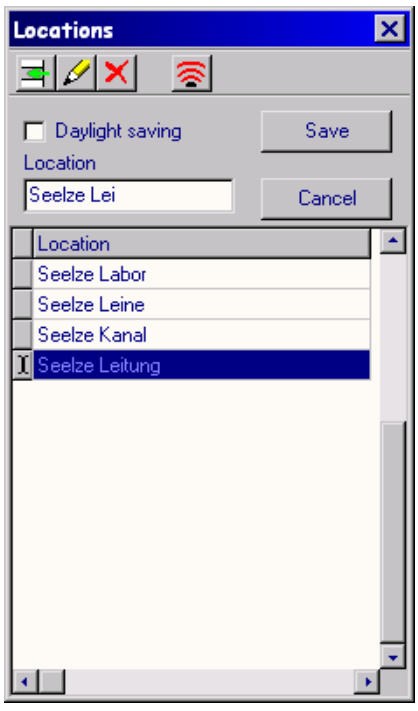
3. Locations

When a result is stored, the NEOMERIS PHOTOMETER PPM 150always asks for the location, where the measurement was performed. By means of this function locations can be defined for the memory function and finally be transferred to the photometer. The field “Location” is optional and can be left blank. On delivery no locations are saved in the NEOMERIS PHOTOMETER PPM 150Photometer PPM 150 or in the software.

	Add Location
	Edit Location
	Erase Location
	Program Locations

In order to enter a location you must open the window in the top left corner by clicking on the location symbol.
With the Add Location / Ort hinzufügen symbol you get access to the first line. Enter the desired name of the location. For any further location you always have to click on the “Add location” symbol again.





If all locations have been added, save them with “Save”. With the symbol Program Locations / Orte programmieren you may send the locations to the photometer (if there is an active connection between the computer and the NEOMERIS) and add them when saving your data.
If you wish to change the name of a location, click on the respective location and then on the Edit / Bearbeiten symbol. Now the location to be changed is displayed in the input window and can be changed. If you wish to delete a location, click on the corresponding line and afterwards on the Erase / Löschen symbol.
It is recommended to save every modification.

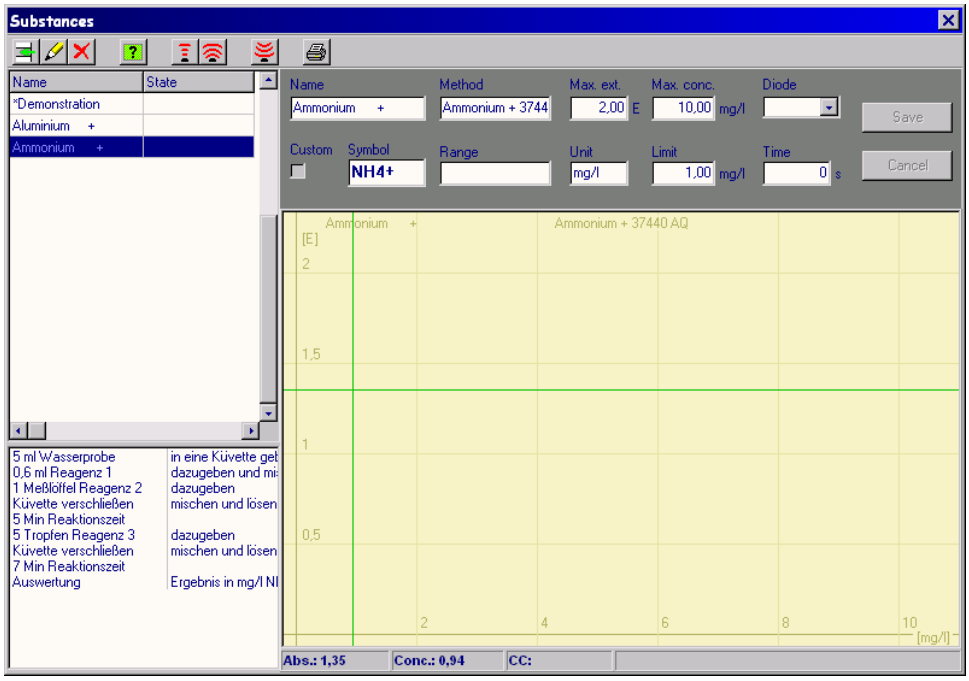
4. Data

This is the most important group of functions enabling you to establish, add or change curves and texts. In this database the curve data of all parameters, the help texts and the messages are saved in all languages.

4.1 Substances

Here all parameters of an analysis can be defined or processed. Each analysis is described by several parameters. The field length of all available fields is stipulated (analogous to Access).

In order to establish a new method of analysis please click on the “Substances” symbol. A list with all methods available in the selected file (please see item 1. Database) is displayed. Now you have the option to add a new method or to modify a method you have already established.
In order to establish a new method, first of all please click on the symbol „Add a method”. Various fields with the parameters to be defined are displayed. For every analysis the following parameters have to be defined:



Name

Text, 15 digits
Name of the analysis (e.g. Ammonium plus 5). This name can be translated into each available language. Each name should only be assigned once, because the photometer always displays the methods in alphabetic order.

Method

Text, 21 digits
This field is optional. Here you may enter the catalogue numbers of the reagents or the like. The method is always saved together with the measuring results (for the History display and the Memory). When you press the HELP key, the method will also be displayed in the main menu at the bottom of the display.

Max Extinction

Figure
This indication is used to display the scale (y-axis) of the curve graph correctly. This value should be higher than the highest extinction value of the analysis. This indication has no affect on the accuracy of the measurement.

Max concentration

Figure
This indication is used to display the scale (x-axis) of the curve graph correctly. The value should be higher than the highest measured concentration. This value has no affect on the accuracy of the measurements, but on the display of the measuring results on the photometer. The higher the value, the less decimal places will be displayed.

Diode

The diode is selected by clicking on the list of the available diodes.

Symbol

Text, 8 digits
The chemical symbol for the parameter (Cl_2) or an abbreviation for the parameter (CSB). In order to display exponents or superscripts, press the < or > key before entering the respective number.

Range

Text, 14 digits
This indication is optional. Here you may enter information about the measuring range of the analysis. The measuring range is always saved together with the measuring results (for the History display and the memory). When you push the HELP key, the measuring range will also be displayed in the main menu at the bottom of the display.

Unit

Text, 5 digits
The unit of the analysis, e.g. mg/l or %. This unit is displayed with the results on the photometer display.

Limit Figure

Optional field, presently not used.

Time Figure

The last reaction time of the respective analysis in seconds. When the respective method is applied, pressing the mg/l key automatically starts the reaction time. If the time is set to 0 s, the reaction time is not automatically started – in the help text you have the option to indicate a reaction time.

Customer

This field is automatically highlighted. Thus customer-specific curves can be distinguished from the curves already set by default. Only customer-specific curves can be changed or erased.

After having completed the above-mentioned fields, it is recommended to save them first. With the symbol „Edit method“ you now can enter the details of the calibration curve.
For this purpose it is recommendable to previously prepare a dilution series from standard solutions / solutions with known concentrations and to treat them with your reagents. As a result you will receive pairs of variates for the extinction at a certain wavelength / concentration.

Calibration points

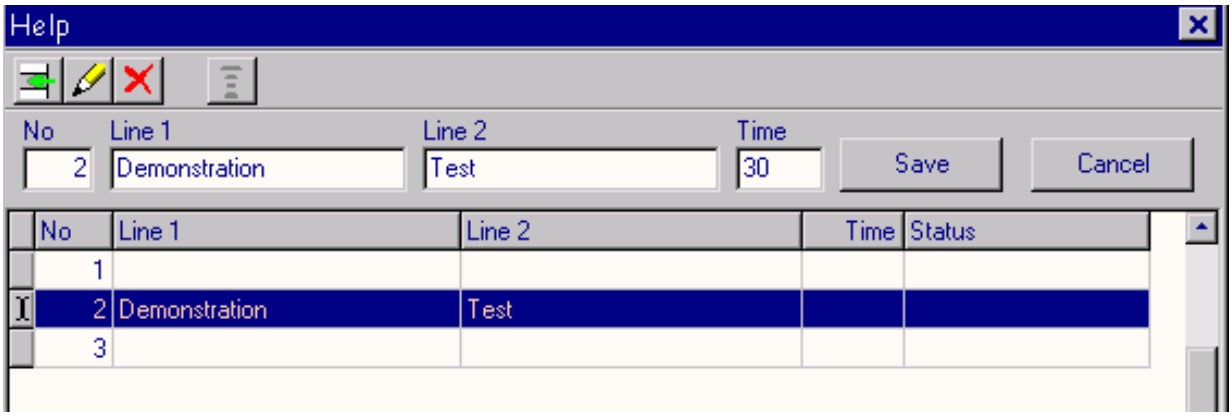
For one curve up to 11 calibration points can be saved. They can either be entered by positioning the cursor or numerically (right mouse button).

After having placed all calibration points you must save them.

Now you may establish a help text in the form of brief operating instructions or information you consider being of importance for each method.

Help

After having defined and saved all above-mentioned parameters you may also enter a help text for the analysis. The help function disposes of maximum 12 steps with two fields each, whereby each field comprises 21 digits. For each of these steps you may enter a specific time (in seconds). In the software this help text is displayed in the bottom-left corner of the “Substances“ window. In order to enter a help text / brief operating instructions for a parameter; open the help window by clicking on the green-shaded question mark.



	Add Help
	Edit Help
	Delete Help
	Program Help

With the symbol „Add Help / Hilfetext hinzufügen“ you get access to the first print line. Enter the desired help text. To get access to further lines you always have to click on the symbol “Add help text” again.

If the complete help text was entered, save the text with Save. With the button „Program Help/ Hilfe programmieren“ you can (if there is any connection between the computer and the NEOMERIS PHOTOMATER MMP 150) send the actual help text to the photometer.

If you would like to change a help text, click on the respective line and than on the symbol “Edit / Bearbeiten”. The print line to be changed appears now in the input window and can be changed. If you would like to erase a text, click on the respective line and afterwards on Erase / Löschen.
It is recommended to save every modification.

4.2 Preferences

With Preferences you have the option to select a working language for data processing. The following data may be changed to different languages: Parameter name, help text and messages.

The standard language is English. This means that all data are initially saved in English, when a new analysis is established. Thereafter the above-mentioned parameters can be saved in another language.

All untranslated fields automatically show the English text. In the database these data are displayed in red and marked as follows: “Not translated“.
The above-described actions can only be performed for the curves established by you.

4.3 Profiles

By means of this function analyses with one language can specifically be selected and transferred to the photometer. The above-described actions can only be performed for the curves established by you.

5. Program

The photometer disposes of an infrared interface. The transmitter / receiver are located at the headpiece of the photometer. Please read the operating instructions of your unit to get more information about the location of the infrared interface on your computer and how to connect the units to this interface.

In order to save energy, the connection to your computer is not active. An active connection to your computer is established, when you call the software on the computer and switch the photometer to the setup mode. The distance between the computer and the photometer should not exceed 20 cm and the transmitter and the receiver must have visual contact.

This connection enables an exchange of data between the computer and the photometer (e.g. reading the memory or transferring a new calibration curve).

The software supports these actions:

1.1 Connect

If the software is open and the photometer is in the setup mode, the connection between these two units is activated automatically. The photometer confirms the connection with the following message on the display: “Connected with the PC“. Immediately afterwards all icons of the software related to the data transfer are activated (colored).

In the event that the automatic connection will not be established quickly enough, it can also be established by using the icon “Connect“.

1.2 Program all

With this function all customer-specific data of the software can be sent to the photometer. With the function “Profiles” either all data or only parts of it can be selected and afterwards be sent to the photometer.

1.3 Erase all

With this function all customer-specific data can be erased from the photometer.

Gebr. Heyl Vertriebsgesellschaft für innovative Wasseraufbereitung mbH
Montoirestraße 6 . D-31135 Hildesheim

Telefon: +49 (0) 5121 7609-0 . Fax: +49 (0) 5121 7609-44

e-mail vertrieb@heyl.de .
Internet http://www.heyl-vertrieb.de

MA2010_0316